

Appl. No. 10/813,250
Reply to Final Office Action of May 28, 2008

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claims 1-2 (previously canceled)

Claim 3 (previously amended): The process of claim 28 wherein the sulfur-oxidated compounds are selected from the group consisting of sulfoxides and sulfones.

Claim 4 (previously amended): The process of claim 28 wherein the adsorbent is selected from the group consisting essentially of activated charcoal, hydrotalcite, ion exchange resin, zeolites, silica-alumina, and silica gel.

Claim 5 (previously amended): The process of claim 28 wherein the adsorbent having adsorbed sulfur-oxidated compounds contains from about 0.2 to about 2 weight percent sulfur-oxidated compounds.

Claim 6 (previously amended): The process of claim 28 wherein the contacting in step (a) is conducted at a temperature from about 25°C (77°F) to about 125°C (257°F) and a pressure from about 1240 kPa (165 psig) to about 1825 kPa (250 psig).

Claim 7 (previously amended): The process of claim 28 wherein the desorbent in step (c) is introduced at a temperature from about 43°C (110°F) to about 125°C (257°F).

Claim 8 (previously amended): The process of claim 28 wherein the desorbent comprises pentane, hexane, benzene, toluene, or xylene.

Claims 9-10 (previously canceled)

Claim 11 (previously amended): The process of claim 28 wherein the hydrocarbonaceous stream comprises diesel boiling range hydrocarbons.

Claims 12-22 (previously canceled)

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Claim 23 (previously amended): The process of claim 32 wherein the purge stream boils in a temperature range lower than that of the desorbent.

Claim 24 (previously amended): The process of claim 32 wherein the purge stream comprises pentane or hexane.

Claims 25-26 (previously canceled)

Claim 27 (previously amended): A process for the removal of sulfur-oxidated compounds from a hydrocarbonaceous stream containing sulfur-oxidated compounds wherein the process comprises:

- (a) contacting a hydrocarbonaceous stream containing sulfur-oxidated compounds and boiling in the range from about 149°C (300°F) to about 538°C (1000°F) with an adsorbent which selectively adsorbs sulfur-oxidated compounds to produce an adsorbent having adsorbed sulfur-oxidated compounds;
- (b) contacting the adsorbent having adsorbed sulfur-oxidated compounds with a purge stream to displace interstitial hydrocarbons having a reduced concentration of sulfur-oxidated compounds;
- (c) contacting the adsorbent having adsorbed sulfur-oxidated compounds from step (b) with a desorbent to produce a desorbent containing sulfur-oxidated compounds and an adsorbent having a reduced content of sulfur-oxidated compounds;
- (d) contacting the adsorbent from step (c) with a hydrocarbonaceous stream containing sulfur-oxidated compounds and boiling in the range from about 149°C (300°F) to about 538°C (1000°F);
- (e) fractionating the desorbent containing sulfur-oxidated compounds from step (c) in a split shell fractionation zone to recover a desorbent having a reduced concentration of sulfur-oxidated compounds, said split shell fractionation zone comprising a fractionator with a dividing wall extending upwardly from a bottom of the fractionator;
- (f) fractionating the purge stream from step (b) in the split shell fractionation zone to recover a purge liquid having a reduced concentration of interstitial hydrocarbons;

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- (g) recycling at least a portion of the desorbent having a reduced concentration of sulfur-oxidated compounds recovered in step (e) to step (c);
- (h) recycling at least a portion of the purge liquid having a reduced concentration of interstitial hydrocarbons recovered in step (f) to step (b); and
- (i) recovering a hydrocarbonaceous stream containing a reduced concentration of sulfur-oxidated compounds.

Claim 28 (previously amended): A process for the removal of sulfur-oxidated compounds from a hydrocarbonaceous stream containing sulfur-oxidated compounds wherein the process comprises:

- (a) contacting a hydrocarbonaceous stream containing sulfur-oxidated compounds with an adsorbent which selectively adsorbs sulfur-oxidated compounds to produce an adsorbent having adsorbed sulfur-oxidated compounds;
- (b) contacting the adsorbent having adsorbed sulfur-oxidated compounds with a desorbent to produce a desorbent containing sulfur-oxidated compounds and an adsorbent having a reduced content of sulfur-oxidated compounds;
- (c) introducing desorbent containing sulfur-oxidated compounds from step (b) into a high sulfur, lower end zone of a split shell fractionation column;
- (d) contacting the adsorbent from step (b) with a hydrocarbonaceous stream containing sulfur-oxidated compounds;
- (e) introducing an initial portion of an effluent from step (c) comprising desorbent from step (b) into a low sulfur, lower end zone of said split shell fractionation column;
- (f) fractionating the desorbent containing sulfur-oxidated compounds from step (b) to recover a desorbent having a reduced concentration of sulfur-oxidated compounds; and
- (g) recovering a hydrocarbonaceous stream containing a reduced concentration of sulfur-oxidated compounds.

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Claim 29 (previously added): The process of claim 28 wherein the hydrocarbonaceous stream containing sulfur-oxidated compounds boils in the range from about 149°C (300°F) to about 538°C (1000°F).

Claim 30 (previously added): The process of claim 28 wherein the fractionating in step (d) is conducted in a split shell fractionation zone.

Claim 31 (previously added): The process of claim 28 wherein at least a portion of the desorbent having a reduced concentration of sulfur-oxidated compounds recovered in step (d) is recycled to step (b).

Claim 32 (currently amended): A process for the removal of sulfur-oxidated compounds from a hydrocarbonaceous stream containing sulfur-oxidated compounds wherein the process comprises:

- (a) contacting a hydrocarbonaceous stream containing sulfur-oxidated compounds with an adsorbent which selectively adsorbs sulfur-oxidated compounds to produce an adsorbent having adsorbed sulfur-oxidated compounds;
- (b) contacting the adsorbent having adsorbed sulfur-oxidated compounds with a purge stream to displace interstitial hydrocarbons;
- (c) contacting the adsorbent having adsorbed sulfur-oxidated compounds from step (b) with a desorbent to produce a desorbent containing sulfur-oxidated compounds and an adsorbent having a reduced content of sulfur-oxidated compounds, said purge stream boiling in a range lower than the boiling range of the desorbent;
- (d) contacting the adsorbent from step (c) with a hydrocarbonaceous stream containing sulfur-oxidated compounds;
- (e) fractionating the desorbent containing sulfur-oxidated compounds from step (c) to recover a desorbent having a reduced concentration of sulfur-oxidated compounds in a fractionation zone; and
- (f) recovering a hydrocarbonaceous stream containing a reduced concentration of sulfur-oxidated compounds;

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- (g) fractionating the purge stream from step (b) in said fractionation zone to recover a purge liquid having a reduced concentration of interstitial hydrocarbons; and
- (h) introducing the purge liquid as the purge stream to the adsorbent having adsorbed sulfur-oxidated compounds.

Claim 33 (previously added): The process of claim 32 wherein the hydrocarbonaceous stream boils in the range from about 149°C (300°F) to about 538°C (1000°F).

Claim 34 (previously added): The process of claim 32 wherein the sulfur-oxidated compounds are selected from the group consisting of sulfoxides and sulfones.

Claim 35 (previously added): The process of claim 32 wherein the adsorbent is selected from the group consisting essentially of activated charcoal, hydrotalcite, in exchange resin, zeolites, silica-alumina, and silica gel.

Claim 36 (previously added): The process of claim 32 wherein the adsorbent having adsorbed sulfur-oxidated compounds contains from about 0.2 to about 2 weight percent sulfur-oxidated compounds.

Claim 37 (previously added): The process of claim 32 wherein the contacting in step (a) is conducted at a temperature from about 25°C (77°F) to about 125°C (257°F) and a pressure from about 1240 kPa (165 psig) to about 1825 kPa (250 psig).

Claim 38 (previously added): The process of claim 32 wherein the desorbent in step (c) is introduced at a temperature from about 43°C (110°F) to about 125°C (257°F).

Claim 39 (previously added): The process of claim 32 wherein the desorbent comprises pentane, hexane, benzene, toluene, or xylene.

Claim 40 (previously added): The process of claim 32 wherein the fractionating in step (e) is conducted in a split shell fractionation zone.

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Claim 41 (previously added): The process of claim 32 wherein at least a portion of the desorbent having a reduced concentration of sulfur-oxidated compounds recovered in step (e) is recycled to step (c).

Claim 42 (previously added): The process of claim 32 wherein the hydrocarbonaceous stream comprises diesel boiling range hydrocarbons.

Claim 43 (previously added): The process of claim 32 wherein an exiting purge stream is fractionated in a split shell fractionation zone.

Claim 44 (previously added): The process of claim 43 wherein at least a portion of the exiting purge stream is recycled to step (b).